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NONPROVISIONAL PATENT APPLICATION

For

**COMPUTER-IMPLEMENTED SYSTEM AND
METHOD FOR PROCESSING CHECK IMAGES**

Inventor:

Miguel Zubizarreta

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**COMPUTER-IMPLEMENTED SYSTEM AND
METHOD FOR PROCESSING CHECK IMAGES**

This application claims the benefit of priority to United States Provisional Application

5 Ser. No. 60/424,885, filed on November 8, 2002, the entire disclosure of which is incorporated
herein by reference.

TECHNICAL FIELD

This patent document relates generally to sorting of the images of checks and
more particularly to a computer-implemented check image sorter system and computer-
10 implemented automated clearing and distribution system.

BACKGROUND AND SUMMARY

Typically, all of the checks deposited by customers into banks are physically
sorted and returned to the Federal Reserve Bank, and then again physically sorted and returned to
15 the banks where the accounts reside. These activities consume a great deal of resources, even for
banks that use physical check sorters (e.g., physical machines that sort paper checks and may be
equipped with imaging cameras to capture images of the checks that they process). This is the
case, at least in part, because until recently all banks have provided physical checks to the
Federal Reserve Bank for sorting and further processing.

20 To address such concerns as well as others, computer-implemented systems and
methods are provided in accordance with the teachings disclosed herein. As an example, a
system and method are used to reduce the effort and cost of electronic presentment by allowing a
computer-based check image sorter to capture a financial institution's checks without physically
separating them. The computer-based check image sorter separates each of the checks based on

the endpoint. An endpoint is a location to which checks need to be presented for payment. There can be one or more ABA numbers or ABA account number combinations for a specific endpoint. A bank then captures digital images of check images deposited and sorts the check images into sorted check image files that are transmitted in order to present the items for payment.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a block diagram depicting processing of checks for electronic sorting and distribution.

Fig. 2 is a block diagram depicting software and computer components utilized in a computer-implemented system for the sorting of electronic check images.

Fig. 3 is a structure diagram depicting a database table used to maintain the sorting information.

Fig. 4 is a block diagram depicting a computer-implemented automated clearing manager process for distributing the sorted check files to corresponding endpoints.

Fig. 5 is a block diagram depicting a computer-implemented automated clearing manager process for receiving check files from other locations and accounting for and reporting data in the received check files.

Figs. 6-10 are block diagrams depicting additional systems and methods for check processing and arrangements facilitated thereby.

DETAILED DESCRIPTION

Fig. 1 is a block diagram depicting the processing of checks for electronic sorting and distribution. A computer-based check image sorter 10 facilitates the electronic processing,

distribution and presentment. Fig. 1 depicts collection of checks 12 received by a check processing machine 14. The check processing machine 14 may be, for example, a check sorter, a check reader and sorter, or a check transport. Other check processing machines 14 may also be used.

5 This check processing machine 14 captures images of the checks 12 along with the data contained in the Magnetic Ink Character Recognition line, commonly referred to as the MICR line. The MICR data line contains the number of the bank, commonly referred to as the ABA number, and the check account number, check serial number and dollar amount of the check. The resulting image and data files 16 are transferred to a computer system which
10 comprises the computer-based check image sorter 10. The example computer system may comprise a single computer, or a plurality of computers in communication over a network, such as a Local Area Network (LAN), a Wide Area Network (WAN), or even the Internet.

15 The computer-based check image sorter 10 creates sorted check image and data files 18 that can be stored on a number of different types of electronic computer media, such as a hard drive 20, magnetic tape 22, or CD-ROM 24. The sorted check files 18 created may conform with standards as defined by an electronic payment association, such as NACHA, or by other regulatory standards.

20 The sorted check files 18 may then be accessed by an automated distribution or clearing system 30 for transmission to one or more institutions 40 that either honor the checks or provide further check processing. The institutions 40 may comprise a banking institution, such as a bank, savings and loan, or credit union; a private or public company; or other type of institution.

The automated distribution or clearing system **30** may be in direct communication with the computer-based check image sorter **10**, e.g., the automated distribution or clearing system **30** may be running on the same computer system as the computer-based check image sorter **10**, or may even be part of a software program that comprises both the computer-based check image sorter **10** and the automated distribution system **30**. Alternatively, automated distribution or clearing system **30** may comprise a separate computer system in communication with the computer-based check image sorter **10** over a network, such as a Local Area Network (LAN), a Wide Area Network (WAN), or even the Internet. In this alternative embodiment, the sorted check image files **18** may be electronically transmitted to the automated distribution system, or the electronic computer media may be physically delivered to the automated distribution or clearing system **30**. The electronic transmission may be a timed batch transmission of a sorted check file via secured communications channels to a specific electronic address, such as a TCP/IP location or a URL.

Fig. 2 is a block diagram depicting software and computer components utilized in a computer-implemented system for the sorting of electronic check images. Fig. 2 depicts in greater detail the processing of the input check file **16** on the computer-based check image sorter **10**. The computer-based check image sorter **10** reads the associated check data in the input check file **16** and the sorting specifications stored in a sorting database **50** and processes the checks from the check file **16** and generates the sorted check files **18**.

The sorting specifications of the sorting database **50** are used to define endpoints where one or more ABA numbers will be sorted into a single file. The sorting database **50** may also define which ABA number will be used to name the sorted check files **18**, if the sorted check files **18** are named by ABA numbers.

While the sorting specifications are illustrated as being stored in a sorting database **50**, other storage structures may be used. For example, the sorting specifications may be stored in an indexed flat file, or even a text file. Typically, however, a database structure is used to store the sorting specification so that processing time is reduced.

5 Fig. 3 is a structure diagram depicting a database structure used to maintain the sorting information in the database **50**. This database structure includes an ABA number field **52**, and account number field **54**, an endpoint number field **56**, and a primary ABA indicator field **58**. A primary ABA indicator field **58** is populated with data if the record stores a primary ABA number for the endpoint specified in the endpoint field **56**. For example, if a processing center
10 is to receive checks with multiple ABA numbers, and the processing center itself has an associated ABA number, then the primary ABA indicator **58** would be populated with the processing center's ABA number.

In an alternative embodiment, the primary ABA indicator field **58** may be replaced by a unique identifier field. Thus, an endpoint may be specified by a unique identifier
15 and receive all associated check images associated with the unique identifier.

A standard naming convention may be used for the sorted check image files **18** created by the computer-based check image sorter **10**. An illustrative naming convention may be as follows:

DestinationID-SourceID-Date-RunID.scf

20 The DestinationID is an identifier associated with an endpoint. The DestinationID may be an endpoint's ABA number, or may be another unique identifier. The SourceID is an identifier associated with a processing center that created the sorted check image files **18**. The SourceID may be the processing center's ABA number, or may be another unique identifier. Alternatively,

the SourceID may be the location at which the check image was captured. The date is the date on which the check image file was created, such as YYYYMMDD. The RunID is a run identifier number or string. The .scf extension is a file association for “sorted check file.”

For the banking industry specifically, an illustrative naming convention may be as 5 follows:

DestinationABA-CaptureLocationABA-Date-RunID.SCF

The DestinationABA is the ABA number associated with an endpoint. The CaptureLocationID is an ABA number associated with the bank that captured the check image. Alternatively, the CaptureLocationID may be the ABA number of the check processing center that created the 10 sorted check image file. The date is the date on which the check image file was created, such as YYYYMMDD. The RunID is a run identifier number or string.

A first naming convention may have the destination bank’s ABA number as the first section of the name, followed by the image capture bank’s ABA number as the second field and then the date of the capture along with a run number. In this example, the date and run 15 number combination are unique for a given capture location.

In an alternative naming convention, the naming convention may have the destination bank’s ABA number as the first section of the name, followed by the processing center’s ABA number as the second field, and then the date of the creation of the check image file with a run number. In this naming convention, the sorted check image file 18 may include 20 checks from a plurality of capture locations.

Fig. 4 is a block diagram depicting a computer-implemented automated clearing manager process for distributing the sorted check files to corresponding endpoints. A sorted check file 18 is distributed by the automated distribution or clearing system 30 according to the

data stored in an endpoint distribution database **51**. The endpoint distribution database **51** may specify an automated clearing manager that distributes the sorted check files to their corresponding endpoints. For example, the sorted check image files **18** shown in Fig. 4 may each have the same endpoint, and thus are transmitted to the institution **60** associated with that endpoint. The transmission may be a secured transmission using known security methods, such as public/private key encryption.

In one embodiment, the endpoint distribution database **51** and the sorting database **50** may be realized by a single database or database file. In another embodiment, separate databases may be used to realize the endpoint distribution database **51** and the sorting database **50**.

The endpoint distribution database **51** may also store data that causes the automated distribution or clearing system **30** to direct the sorted files **18** to servers **23** and **25** which are respectively capable of automatically creating computer tapes **22** and CDs **22**. Disposition of the stored check image files **18** may then be determined according to a service agreement between the automated distribution or clearing system **30** and the institution **60**. For example, the sorted check image files **18** may then be stored for a long term at the automated distribution or clearing system **30** in case the institution requests a retransmission of the files **18**, or may alternatively be provided to the institution **60**. A document management system may be used to facilitate access and retrieval of the sorted check image files **18**.

Fig. 5 is a block diagram depicting the computer-implemented automated distribution or clearing system **30** receiving check files **72** and **92** from other locations and accounting for and reporting data in the received check files. Fig. 5 depicts the automated distribution or clearing system **30** using the information in the endpoint distribution database **51**

to transmit sorted check files **74** and **82** to institutions **70** and **80**, respectively, and recording the transactions in a financial clearing database **31**.

A service center may comprise the computer-based check image sorter **10** and the automated distribution or clearing system **30**. Bank **70** may provide sorted check image files **70** to the automated distribution or clearing system **30**, and may receive sorted check image files **74** from the automated distribution or clearing system **30**. Bank **80** may receive sorted check image files **82** from the automated distribution or clearing system **30**. Bank **90** may provide unsorted check image files **92** to the automated distribution or clearing system **30**. A financial clearing database **31** stores data related to the number of checks sent to and received from each of the banks **70**, **80**, and **90**, and also the corresponding amounts of the checks. Reports may be generated that reconcile the clearing of outbound checks versus inbound checks.

The service center may provide automated distribution and clearing according to a service agreement. For example, each bank **70**, **80**, and **90** could be charged a unit cost per check received, a unit cost per check image sorted, a unit cost per check distributed, and/or a unit cost per check cleared. Combinations of unit costs may also be used. For example, bank **70** possesses a computer-based check image sorter **10** and provides the sorted check image file **72** to the automated distribution or clearing system **30**. Bank **90** does not possess a computer-based check image sorter **10** and thus provides only an unsorted check image file **92** to the automated distribution or clearing system **30**. Thus, for each check from bank **70** processed, the service center may charge only a unit cost per check received, while for each check from bank **90** processed, the service center may charge a unit cost per check received and a unit cost per check sorted. Other service pricing arrangements may also be used.

Other relationships between banks and third parties may also be facilitated by the computer-implemented systems and methods for processing check images disclosed herein. For example, a banking institution itself may scan and create digital images of the checks and related data files, or may receive digital images and related data files from a third party. Once the digital 5 check files are created, then the check image sorter system may be used to create the sorted check image files. The parties that may perform the scanning and/or sorting may range greatly, such as an independent contractor who specializes in digital content creation. Alternatively, the scanning and sorting may be carried out by a company who is the payee designated on the check. For example, a grocery store may receive many checks from many bank accounts at different banks, 10 and thus may scan the check images and create the sorted check image file. The grocery store may even implement an automated distribution system so that the sorted check image files are distributed directly to their corresponding banks.

Other types of relations may also be facilitated by the use of the check image sorter approaches described herein. Figs. 6-10 are block diagrams depicting additional process 15 flows for handling checks. In Fig. 6, 1st National Bank 100, which has a check image sorter 10, forms relationships (e.g., via agreements, contracts or the like) with several other banking institutions 2nd National Bank 110, 3rd National Bank 120, and 4th National Bank 130. Company 140 has accounts at both the 1st National Bank 100 and the 2nd National Bank 110, and the 1st National Bank 100 receives deposits from depositors 150.

20 The first relationship 112 with the 2nd National Bank 110 is a clearing relationship in which sorted check images are sent to the 1st National Bank 100; the second relationship 122 with the 3rd National Bank 120 is a mutual clearing relationship in which sorted check images are sent between the 1st National Bank 100 and the 3rd National Bank 120; and the third relationship

132 with the 4th National Bank 130 may be some other relationship facilitated by the use of the check image sorter systems and methods described herein, such as a reciprocal service relationship or a service provider relationship. Banks 170, 180 and 190 do not have an established processing service, and thus receive their corresponding checks from the Federal

5 Reserve Bank. Thus, checks cleared against banks 170, 180 and 190 incur a processing fee by the Federal Reserve Bank, while those checks cleared by bank 120 that are provided by bank 100 do not incur a processing fee by the Federal Reserve Bank 160. Because the relationship 122 is reciprocal, checks cleared between banks 100 and 120 do not incur a processing fee by the Federal Reserve Bank 160.

10 The company 140 may be a large company, such as a utility, having a correspondingly large number of customers with accounts at the 2nd National Bank 110. Thus, the company 140 may directly distribute the sorted check images to the 2nd National Bank 110, and the remainder of its check images to the 1st National Bank 100. Those checks provided directly from the company 140 to the 2nd National Bank 110 are settled more quickly than if they 15 were provided to the 1st National Bank 100, and also do not incur a check cashing fee that the 1st National Bank 100 may charge. For those checks that are sent from the company 140 to the 1st National Bank 100, the 1st National Bank 100 may clear them directly in accordance with the systems and methods as described above, or may pass them on to the Federal Reserve Bank 160. The company 140 would thus incur the corresponding processing fees.

20 The 1st National Bank 100 may offer to the company 140 as an optional service the check clearing and distribution service facilitated by the systems and method disclosed herein. For example, the 1st National Bank 100 may offer the service at a lower per unit cost than would be normally incurred if the checks are passed directly to the Federal Reserve Bank 160.

The 1st National Bank 100 may also distribute check files having a particular banking institution as their designated endpoint directly to the particular banking institution. Direct distribution to the endpoint institution reduces expenses at least in part by not having the Federal Reserve Bank 160 directly or indirectly involved. The 1st National Bank 100 may optionally charge a small fee 5 due to this arrangement. In addition to direct distribution, check image files may also be distributed to the Federal Reserve Bank.

The 1st National Bank 100 also may provide sorted check images to the Federal Reserve Bank 160, which in turn may provide the corresponding sorted check images to multiple other banks (e.g., 5th National Bank 170, 6th National Bank 180....Nth National Bank 190) as 10 shown and as previously described.

Fig. 7 provides a block diagram illustrating the processing of incoming checks to the 1st National Bank 100. The 2nd National Bank 110 provides unsorted check images 114 to the 1st National Bank 100 pursuant to an agreement between the 2nd National Bank 110 and the 1st National Bank 100. Deposited checks 116 are also provided to the 1st National Bank 100. The 15 check images 114 and the deposited checks 116 are then processed accordingly by the check image sorter system 10 and automated distribution and clearing system 30. For example, the unsorted check images 114 may be sorted, and the deposited checks 116 may be scanned, imaged and sorted. Absent any further agreement requirements, the 1st National Bank 100 then provides the sorted check image files to the Federal Reserve Bank 160.

Fig. 8 provides a block diagram illustrating the processing outgoing checks from the 1st National Bank 100. The 1st National Bank 100 creates sorted check images 124, 134, 172, 182 and 192 from checks deposited at the 1st National Bank 100, and from checks or check images received from other banks. Pursuant to agreements between the 1st National Bank 100

and the 3rd and 4th National Banks 120 and 130, the 1st National Bank 100 provides a sorted check image file 124 to the 3rd National Bank 120, and a sorted check image file 134 to the 4th National Bank 130. Thus, the sorted check image files 124 and 134 are directly provided to their endpoint institutions - the 3rd National Bank 120 and the 4th National Bank 130, respectively.

5 The remaining check images 172, 182, and 192, which are sorted check images for the 5th, 6th and Nth National Banks 170, 180 and 190, are provided to the Federal Reserve Bank 160, which in turn may provide the corresponding check images to the 5th, 6th and Nth National Banks as 170, 180 and 190. Thus, in this example, the sorting of the check files by the 1st National Bank 100 using the check image sorter system 10 and automated distribution and 10 clearing system 30 allows the Federal Reserve Bank 160 to deliver check files to other institutions without having the Federal Reserve Bank sort the check files. The Federal Reserve Bank 160 may charge a reduced fee for handling the presorted check files.

Fig. 9 provides a block diagram for received check images. Pursuant to an agreement with the 3rd National Bank 120, the 1st National Bank 100 receives sorted check image files 126 for 1st National Bank 100 checks from the 3rd National Bank 120. The 1st National Bank 100 may then provide sorted check images to the Federal Reserve Bank 160.

Fig. 10 illustrates a payee company 140 having a check image sorter system 10 and automated distribution and clearing system 30 to sort the checks received from its customers. The customers provide checks 142 to the payee company 140. Check images and related data 20 files are created, and the company 140 uses the check image sorter program to sort the check files 144 and 146, based upon the endpoint banking institution. The payee company 140 may then distribute the sorted check files directly to the endpoint institutions. For example, the payee company 140 creates a set of sorted check images 144 for the 1st National Bank 100, and a set of

sorted check images 146 for the 2nd National Bank 110. The payee company 140 may then be eligible for a reduction in fees charged by the 1st and 2nd National Banks 100 and 110 because the check files are presorted, or may receive a reduction in fees charged pursuant to an agreement with the 1st and 2nd National Banks 100 and 120.

5 The embodiments described herein are examples of structures, systems or methods having elements corresponding to the elements of the invention recited in the claims. This written description may enable those of ordinary skill in the art to make and use embodiments having alternative elements that likewise correspond to the elements of the invention received in the claims. The intended scope of the invention thus includes other
10 structures, systems or methods that do not differ from the literal language of the claims, and further includes other structures, systems or methods with insubstantial differences from the literal language of the claims.

As an example of the wide scope of the approaches disclosed herein, data signals transmitted using a communication channel may be used with the check processing systems and
15 methods. The data signals can include any type of data to be transmitted, such as a sorted check file. The data signal may be packetized data that is transmitted through a carrier wave or other medium across the network. Still further, computer-readable media may be provided to and used that is capable of causing a computer to perform the methods and implement the systems disclosed herein.